

## ABSTRACT:

LITHOGRAPHIC PROJECTION APPARATUS, DEVICE MANUFACTURING  
METHOD AND DEVICE MANUFACTURED THEREBY

A lithographic projection apparatus comprising a radiation system for supplying a projection beam of electromagnetic radiation in the extreme ultraviolet (EUV) range, a support structure for supporting patterning structure, the patterning structure serving to pattern the projection beam according to a desired pattern, a substrate table for holding a substrate and a projection system for projecting the patterned beam onto a target portion of the substrate. A space within the apparatus, which space contains a mirror, is supplied with a hydrocarbon gas which forms a protective cap layer on the mirror surface. The partial pressure of the hydrocarbon gas in the space is controlled in response to variations in the background pressure in the space and/or in the reflectivity of the mirror, such that the thickness of the cap layer on the mirror remains within an acceptable range. The partial pressure of hydrocarbon may be increased in order to sputter away the cap layer and/or, if extra multilayers are provided on the mirror, the top layer(s) of the mirror, thus providing a clean mirror surface. The hydrocarbon used may be an alcohol, in which case the cap layer formed is self-terminating.

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